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Artificial Hibernation of Some Temperate North American Snakes

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Introduction

In the temperate zone of North America snakes must hibernate during the winter—some for six months or more in parts of Canada (Gregory, 1984). In nature, this period serves several purposes. First, it protects the reptiles from freezing temperatures that would kill them. Second, in species which form aggregations at hibernacula, hibernation may increase reproductive success by bringing males and females together (Gregory, 1984). Lastly, in some species, hibernation may be necessary for the production of the hormones that permit fertility (Mara, 1994). Herpetoculturists and herpetologists have tried to imitate this inactive period by placing their snakes in a room or refrigerator that remains around 10°C (Trutnau, 1986; Frye, 1991). Zappalorti and Reinert (1994) described methods for creating artificial hibernacula for free-ranging snakes in New Jersey. The current paper deals with the former methods (using a refrigerator as a hibernaculum).

Hibernating captive snakes can serve several purposes: it simulates natural conditions, increases reproductive behavior, increases reproductive success, and reduces the cost of maintaining captives (Murphy and Campbell, 1987; Holtzman et al., 1989). In addition, it may be necessary to artificially hibernate a snake if its prey becomes difficult to obtain. For example, I chose to hibernate a male *Diadophis punctatus edwardsii*, not because it voluntarily stopped feeding, but because it was nearly impossible to obtain its prefered food of plethodontid salamanders during the winter. This individual refused to eat earthworms or previously frozen salamanders.

It may be necessary to hibernate some captive snakes because they stop feeding in the fall, as they would in the wild. These individuals may starve despite ideal temperatures and being offered appropriate food items. While it is generally a bad idea to hibernate unhealthy snakes, it could benefit anorexic individuals (DeNardo, 1996), such as those that stop feeding in the autumn.

This paper relates my experiences hibernating some temperate zone snakes.

Materials and methods

During the winter seasons of 1996–2000, 21 individuals of five snake species (*Diadophis punctatus edwardsii* (n = 1), *Storeria dekayi dekayi* (n = 3), *S. occipitomaculata occipitomaculata* (n = 3), *Thamnophis sirtalis sirtalis* (n = 11) and *Virginia pulchra* (n = 3) were artificially hibernated in a General Electric refrigerator (model GE SC455). Some individuals were hibernated during more than one season, resulting in 28 individual hibernation events. Feeding was discontinued ten days prior to being placed into the hibernaculum. No acclimation period was provided. All snakes were placed in Tamor Store-N-View plastic shoeboxes, with several layers of newspaper used as a substrate. A water bowl was provided and water changed as needed; usually every 7–10 days, but longer if a snake was in the bowl. Air holes were drilled in the lid and upper sides of the shoeboxes. The temperature inside the refrigerator was taken twice a week (on the third and seventh day) with a digital thermometer accurate to the nearest 0.1°C. Each snake was weighed to the nearest gram immediately before entering and after being removed from hibernation, using an Ohaus electric scale.

Results and discussion

1996–1997. Three eastern garter snakes (*T. s. sirtalis* nos. 1–3; 1 male and 2 females), one female northern redbelly snake (*S. o. occipitomaculata* no. 1), and one male northern ringneck snake (*D. p. edwardsii* no. 1) were artificially hibernated. All snakes, except female *T. s. sirtalis* no. 3 were placed into a shoebox, and entered hibernation on 4 December 1996. *Thamnophis s. sirtalis* no. 3 was placed into a separate shoebox and was entered into the hibernaculum on 19 January 1997. This group of snakes was hibernated for 55–88 days. Most specimens lost from 1.5 to 16.7% of their prehibernation mass; the *D. p. edwardsii* maintained the same weight throughout the hibernation period (Table 1). Temperature within the hibernaculum ranged 4.4–6.6°C ($\bar{x}$ = 5.5, sd = 0.4, n = 30). Upon being removed from hibernation, the largest female garter snake (*T. s. sirtalis* #3) was sluggish and lethargic, and died

Table 1. Artificial hibernation of snakes during 1996–1997. The number following the species name is the individual specimen number. † denotes specimens that died during or immediately after hibernation.

Species	Sex	Date entered	Mass (g)	Date removed	Mass (g)	Mass gain / loss
Diadophis punctatus #1	♂	4 Dec. 1996	7	2 Mar. 1997 (88 d)	7	0.0
Storeria occipitomaculata #1	♀	4 Dec. 1996	6	20 Feb. 1997 (78 d)	6	-16.7%
Thamnophis sirtalis #1	♂	4 Dec. 1996	46	6 Feb. 1997 (64 d)	45	-2.2%
Thamnophis sirtalis #2	♀	4 Dec. 1996	68	6 Feb. 1997 (64 d)	67	-1.5%
Thamnophis sirtalis #3†	♀	19 Jan. 1997	92	15 Mar. 1997 (55 d)	85	-7.6%

Table 2. Artificial hibernation of snakes during 1997–1998. The number following the species name is the individual specimen number. † denotes specimens that died during or immediately after hibernation.

Species	Sex	Date entered	Mass (g)	Date removed	Mass (g)	Mass gain / loss
Diadophis punctatus #1	♂	7 Dec. 1997	10	24 Feb. 1998 (79 d)	9	−10.0%
Storeria dekayi #1	♀	4 Dec. 1997	10	24 Feb. 1998 (82 d)	10	0.0
Storeria dekayi #2	♀	4 Dec. 1997	5	24 Feb. 1998 (82 d)	5	0.0
Storeria dekayi #3	♂	4 Dec. 1997	4	24 Feb. 1998 (82 d)	4	0.0
Storeria occipitomaculata #2	♀	4 Dec. 1997	9	24 Feb. 1998 (82 d)	9	0.0
Storeria occipitomaculata #3	♀	4 Dec. 1997	< 1	24 Feb. 1998 (82 d)	< 1	0.0
Thamnophis sirtalis #1	♂	5 Dec. 1997	44	24 Feb. 1998 (81 d)	41	−6.8%
Thamnophis sirtalis #4	♀	5 Dec. 1997	99	26 Feb. 1998 (83 d)	97	−2.2%
Thamnophis sirtalis #5†	♀	5 Dec. 1997	78	26 Feb. 1998 (83 d)	73	−6.4%
Virginia pulchra #1	♀	4 Dec. 1997	6	24 Feb. 1998 (82 d)	5	−16.7%
Virginia puchra #2†	♀	4 Dec. 1997	< 1	24 Feb. 1998 (died during hibernation)		

three days posthibernation. This specimen appeared healthy prior to entering hibernation. A necropsy was performed and it was determined that the most likely cause of death was complications resulting from visceral gout. Mortality during this period was 20%.

1997–1998. During this period, eleven individuals of five species were hibernated: a male northern ringneck snake (*D. p. edwardsii* #1), three northern brown snakes (*S. d. dekayi* #1–3; one male and two females), two female northern redbelly snakes (*S. o. occipitomaculata* #2 and 3; a juvenile and an adult), three Eastern garter snakes (*T. s. sirtalis* nos. 1, 4 and 5; one male and two females), and two female mountain earth snakes (*V. pulchra* nos. 1 and 2; one adult and one juvenile). All *Storeria* and *Virginia* were placed into hibernation on 4 December 1997. All *Thamnophis* were entered on 5 December 1997; the northern ringneck snake was entered on 7 December 1997. Snakes were hibernated for 79–83 days. Among the garter snakes, weight loss during hibernation ranged 2.0 to 6.8% of prehibernation weight. The *D. p. edwardsii* and adult *V. pulchra* lost 10 and 16.7% of prehibernation weight respectively. All other snakes maintained the same weight during the hibernation period (Table 2). Temperature within the hibernaculum ranged 3.8–6.6°C ($\bar{x}$ = 5.3, sd = 0.9, n = 25). The *V. pulchra* neonate died seven days into hibernation, and was the only mortality (9.1%) during this period. Fitch (1999) noted that young snakes are more vulnerable to mortality during hibernation than adults. Parker and Plummer (1987) state that in wild colubrid snakes, 45–85.5% may not survive their first hibernation.

1998–1999. The same male *D. p. edwardsii* that had been hibernated during the previous two seasons was placed into hibernation for a third time on 17 November 1998. Three garter snakes *(T. s. sirtalis* nos. 1, 4 and 6; one male and two females) were also hibernated, and were placed in the shoebox with the northern ringneck snake on 1 December 1998. The male garter snake (*T. s. sirtalis* no. 1) had been hibernated during the previous two seasons. Snakes were hibernated for 83–105 days, at temperatures ranging from 3.0 to 6.5°C ($\bar{x}$ = 4.2, sd = 0.9, n = 31). The northern ringneck snake lost no weight during the 105 days it was hibernated. Among the three *T. s. sirtalis*, no. 1 lost 6.2% of prehibernation weight, no. 4 showed no change, and no. 6 gained 3.8% (Table 3). All snakes spent some time in the water bowl, however *T. s. sirtalis* no.4 spent 54% of its time (46 out of 85 days) in the water bowl; while *T. s. sirtalis* no.6 spent 39% of its time (33 of 85 days) in the water (Figure 1). There was no mortality during this period.

1999–2000. Seven eastern garter snakes (*T. s. sirtalis* nos.

Table 3. Artificial hibernation of snakes during 1998–1999. The number following the species name is the individual specimen number.

Species	Sex	Date entered	Mass (g)	Date removed	Mass (g)	Mass gain / loss
Diadophis punctatus #1	♂	17 Nov. 1998	10	2 Mar. 1999 (105 d)	10	0.0
Thamnophis sirtalis #1	♂	1 Dec. 1998	48	22 Feb. 1999 (83 d)	45	−6.2%
Thamnophis sirtalis #4	♀	1 Dec. 1998	120	24 Feb. 1999 (85 d)	120	0.0
Thamnophis sirtalis #6	♀	1 Dec. 1998	52	24 Feb. 1999 (85 d)	54	+ 3.8%

Table 4. Artificial hibernation of snakes during 1999–2000. The number following the species name is the individual specimen number.

Species	Sex	Date entered	Mass (g)	Date removed	Mass (g)	Mass gain / loss
Thamnophis sirtalis #1	♂	7 Dec. 1999	52	27 Feb. 2000 (82 d)	48	-7.7%
Thamnophis sirtalis #4	♀	7 Dec. 1999	153	27 Feb. 2000 (82 d)	152	-0.6%
Thamnophis sirtalis #7	♂	14 Dec. 1999	20	21 Feb. 2000 (68 d)	34	+ 70.0%
Thamnophis sirtalis #8	♂	14 Dec. 1999	6	21 Feb. 2000 (68 d)	20	+ 233.0%
Thamnophis sirtalis #9	♂	14 Dec. 1999	14	21 Feb. 2000 (68 d)	27	+ 92.8%
Thamnophis sirtalis #10	♀	14 Dec. 1999	43	21 Feb. 2000 (68 d)	57	+ 32.5%
Thamnophis sirtalis #11	♂	18 Dec. 1999	28	21 Feb. 2000 (64 d)	31	+ 10.7%
Virginia pulchra #3	♂	7 Dec. 1999	6	27 Feb. 2000 (82 d)	6	0.0

1, 4 and 7–11; five males and two females) and a male mountain earth snake (*V. pulchra* no. 3) were hibernated during the winter of 1999–2000. Two shoeboxes were used, with the first containing two *T. s. sirtalis* (nos. 1 and 4) and *V. pulchra* no. 3. The second shoebox held the remaining five garter snakes (nos. 7–11). Two snakes, *T. s. sirtalis* nos. 1 and 4, had been hibernated during the previous season. The snakes were artificially hibernated for 64–82 days (Table 4). The two largest garter snakes lost 0.6– 7.7 % of their prehibernation mass. In the juvenile garter snakes weight was gained by all individuals and ranged from 10.7 to 233.0% of prehibernation weight (Table 4). During the 64– 68 days that juveniles were hibernated, all spent considerable time (up to 7 consecutive days) in the water bowl. In laboratory settings, *T. sirtalis* prefers to hibernate in water, and in this way remains hydrated (Costanzo, 1988). In my garter snakes, the dramatic increase in weight due to the intake of water was primarily observed in smaller individuals (initial mass 6–43 g). Seven snakes that showed no change in mass during hibernation were 10 g or under. Smaller snakes appear to be better at taking in a relatively large volume of water to hydrate themselves, and are also less likely than larger individuals to lose weight. This obviously helps prevent dehydration during hibernation; perhaps the resulting increase in mass also buffers the now "larger" snake from slight temperature changes. There was no difference between prehibernation and posthibernation weight in *V. pulchra*. Temperature within the hibernaculum ranged from 1 to 3.5° C ($\bar{x}$ = 2.5, sd = 0.6, n = 24). No mortality occurred during this period.

Figure 1. Three eastern garter snakes (*Thamnophis sirtalis sirtalis*) and a northern ringneck snake (*Diadophis punctatus edwardsii*) artificially hibernated during 1998–1999. *Thamnophis s. sirtalis* no. 4 is in the water bowl, and spent 46 of 85 days in the water bowl.

Several authors (Murphy and Campbell, 1987; Mara, 1994; Perlowin, 1994; Funk, 1996) recommend that snakes from temperate regions be hibernated at temperatures between 10 and 16°C for at least two months; however, Coborn (1991) and Rossman et al. (1996) suggest lower temperatures (4–10°C) for a similar length of time. The species artificially hibernated by me have been found in nature to hibernate at temperatures in the lower range (Table 5).

DeNardo (1996) noted that loss in body weight during hibernation is usually less than ten percent. Weight loss in my artificially hibernated snakes averaged 7.1% of prehibernation mass (range 0.6–16.7 %). (The calculation of this mean ex-

Table 5. Comparison of body temperatures between wild and captive snakes during hibernation. For wild snakes, the temperature range is given in degrees Centigrade, followed by the region where observed, and the literature source. The temperature range (°C) for individuals artificially hibernated in the present study is given under the heading "Artificially hibernated."

Species	Artificially hibernated	Wild
Diadophis punctatus	3.0–6.6°	0–10° Kansas (Fitch, 1975)
Storeria dekayi	3.8–6.6°	3–7° Pennsylvania (Ernst and Ernst, 2003)
S. occipitomaculata	3.8–6.6°	N/A
Thamnophis sirtalis	1.0–6.6°	3.4–7.0° Michigan (Carpenter, 1953) 2–7° British Columbia (MacArtney et al., 1989)
Virginia pulchra	1.0–6.6°	N/A

cluded individuals that gained weight or remained the same.). A third of the snakes (seven individuals) showed no loss or gain in body weight; whereas six garter snakes gained between 3.8 and 233.0% of their prehibernation body weight as a result of water intake (see above).

While artificially hibernating snakes may have several benefits, such as improving reproductive success and or decreasing maintenance costs, there are also risks. The most significant of these would be the possibility of mortality. Total mortality (# deaths / # individuals hibernated) during the four hibernation periods in this paper was 7.1% (2 of 28). This risk may be reduced by not hibernating unhealthy or very young individuals (Rossi, 1992).

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Literature Cited

Carpenter, C. C. 1953. A study of hibernacula and hibernating associations of snakes and amphibians in Michigan. Ecology 34:74-80.

Coborn, J. 1991. The atlas of snakes of the world. Neptune City, New Jersey: T.F.H. Publications.

Costanzo, J. P. 1988. Recovery from ice-entombment in garter snakes. Herpetological Review 19(4):76-77.

DeNardo, D. 1996. Reproductive biology. Pp. 212-224. *In*: D. Mader, editor, Reptile medicine and surgery. Philadelphia, Pennsylvania: W. B. Saunders Co.

Ernst, C. H., and E. M. Ernst. 2003. Snakes of the United States and Canada. Washington, D.C.: Smithsonian Books.

Fitch, H. S. 1975. A demographic study of the ringneck snake (*Diadophis punctatus*) in Kansas. Univ. Kansas. Mus. Nat. Hist. Misc. Publ. 62:1-53.

————. 1999. A Kansas snake community: Composition and changes over 50 years. Malabar, Florida: Krieger Publishing Co.

Frye, F. L. 1991. Biomedical and surgical aspects of captive reptile husbandry. Malabar, Florida: Krieger Publishing Co.

Funk, R. S. 1996. Biology: Snakes. Pp. 39-46. *In*: D. Mader, editor, Reptile medicine and surgery. Philadelphia, Pennsylvania: W. B. Saunders Co.

Gregory, P. T. 1984. Communal denning in snakes. Pp. 57-75. *In*: R. A. Seigel, L. E. Hunt, J. L Knight, L. Malaret and N. L. Zuschlag, editors, Vertebrate ecology and systematics: A tribute to Henry S. Fitch. Lawrence, Kansas: Univ. Kansas Mus. Nat. Hist. Special Publ. No. 10.

Holtzman, D. A., G. R. Ten Eyck and D. Begun. 1989. Artificial hibernation of garter (*Thamnophis* sp.) and corn (*Elaphe guttata guttata*) snakes. Herpetological Review 20(3):67-69.

MacArtney, J. M., K. W. Larson and P. T. Gregory. 1989. Body temperatures and movements of hibernating snakes (*Crotalus* and *Thamnophis*) and thermal gradients of natural hibernacula. Canadian J. Zoology 67:108-114.

Mara, W. P. 1994. Garter and ribbon snakes. Neptune City, New Jersey: T.F.H. Publications.

Murphy. J. B., and J. A. Campbell. 1987. Captive maintenance. Pp. 165-181. *In*: R. A. Seigel, J. T. Collins and S. S. Novak, editors, Snakes: Ecology and evolutionary biology. New York: Macmillan Publishing Co.

Parker, W. S. and M. V. Plummer. 1987. Population ecology. Pp. 253-301. *In*: R. A. Seigel, J. T. Collins and S. S. Novak, editors, Snakes: Ecology and evolutionary biology. New York: Macmillan Publishing Co.

Perlowin, D. 1994. The general care and maintenance of garter snakes and water snakes. Lakeside, California: Advanced Vivarium Systems, Inc.

Rossi, J. V. 1992. Snakes of the United States and Canada: Keeping them healthy in captivity, Volume 1. Eastern area. Malabar, Florida: Krieger Publishing Co.

Rossman, D. A., N. B. Ford and R. A. Seigel. 1996. The garter snakes: Evolution and ecology. Norman: University of Oklahoma Press.

Trutnau, L. 1986. Nonvenomous snakes. Woodbury, New York: Barron's.

Zappalorti, R. T., and H. Reinert. 1994. Artificial refugia as a habitat-improvement strategy for snake conservation. Pp. 369-375. *In*: Murphy, J. B., K. Adler and J. Collins, editors, Captive management and conservation of amphibians & reptiles. Society for the Study of Amphibians and Reptiles. Contributions to Herpetology, Number 1.

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Notes on the Reproductive Biology of the Cape Thick-toed Gecko, *Pachydactylus capensis* (Squamata: Gekkonidae) from Southern Africa

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Abstract

Histological analysis was conducted on the reproductive organs of 61 Cape thick-toed geckos, *Pachydactylus capensis*, from the Republic of South Africa and Botswana. The ovarian cycle of *P. capensis* females is such that they are reproductively active from July to February. Histological evidence is presented that more than one clutch can be produced in a reproductive season. Female *P. capensis* mature at 43 mm SVL. Males follow a seasonal testicular cycle in which maximum sperm formation (full spermiogenesis) was recorded from July to February. Recovery (recrudescence) is completed during winter so males are ready to commence breeding in spring. A similar reproductive strategy occurs in the congener *Pachydactylus bibronii*. Male *P. capensis* mature at 45 mm SVL.

The Cape thick-toed gecko, *Pachydactylus capensis*, is known from the Cape Provinces of the Republic of South Africa and occurs through most of the African subcontinent (Branch, 1998). Previous information on reproduction of *P. capensis* involves reports of clutch sizes or time of egg deposition and is in Loveridge (1972), De Waal (1978), Pianka and Huey (1978), Visser (1984), Pianka (1986), Auerbach (1987), Bates (1991), Branch (1998). This note provides additional information on the reproductive biology of *P. capensis* from a histological examination of museum specimens. The first information on the testicular cycle of *P. capensis* is presented. Minimum sizes for reproduction are given for both sexes. Knowledge of the reproductive biology of an organism is needed to understand the evolution of life-history strategies. These data are also useful in formulating conservation policies.

Thirty-four *P. capensis* adult females (mean snout-vent length, SVL = 54 mm ± 6 SD, range = 43–64 mm) and 27 adult males (SVL = 57 mm ± 6 SD, range = 45–65 mm) were examined from the herpetology collection of the Natural History Museum of Los Angeles County (LACM), Los Angeles: Republic of South Africa LACM 82902-82907, 82911, 82914, 82916, 82917, 82920, 82922-82925, 82929, 82933, 82934, 82937, 82939, 82942, 82943, 82946, 82947, 82950- 82953, 82955-82959. Botswana LACM 82927, 82960-82962, 82966, 82967, 82969, 82971, 82972, 82975, 82976, 82980-82982, 82985, 82986, 82990, 82993, 82995, 82996, 82998, 82999, 83001-83006. Specimens from the Republic of South Africa were from between 27°00′S to 28°17′S and 20°43′E to 23°34′E; specimens from Botswana were from between 26°08′S to 26°48′S and 20°53′E to 22°28′E; both samples were collected during 1970. Mean clutch value based on counts of oviductal eggs from these specimens of *P. capensis* are in Pianka (1986). Gonads were dehydrated in ethanol, embedded in paraffin, sectioned at 5 µm and stained with Harris hematoxylin followed by eosin counterstain. Enlarged ovarian follicles (> 3 mm length) were counted; no histology was done on them. Male and female mean body sizes (SVL) were compared with an unpaired *t* test using Instat (vers. 3.0b, Graphpad Software, San Diego, CA).

There was no significant difference between mean male and female body sizes (unpaired *t* test, $t = 1.9$, $df = 59$, $P = 0.06$). The smallest mature female *P. capensis* (yolk deposition in progress) was from October and measured 43 mm SVL (LACM 82951). Monthly changes in the ovarian cycle are shown in Table 1. The ovarian cycle appears to begin in July when one female was undergoing yolk deposition (basophilic yolk granules present in an ovarian follicle). The first female with an enlarged ovarian follicle (5.1 mm length) was from August. This female (LACM 82950) was also undergoing early yolk deposition in a 2 mm diameter follicle for a subsequent clutch to be completed later in the reproductive season. This indicates that *P. capensis* may produce multiple clutches in the same reproductive season. The congener *Pachydactylus fasciatus* may produce as many as six clutches a year in captivity (Barts et al., 2002). One female *P. capensis* from December (LACM 82958) contained a corpus luteum. En-

Table 1. Monthly changes in the ovarian cycle of 34 *Pachydactylus capensis* from southern Africa.

Month	*n*	Inactive	Yolk deposition	Follicles > 3 mm	Follicles > 3 mm and early yolk deposition	Corpus luteum
January	4	0	2	2	0	0
February	9	8	0	1	0	0
April	4	4	0	0	0	0
June	3	3	0	0	0	0
July	4	3	1	0	0	0
August	2	1	0	0	1	0
September	1	1	0	0	0	0
October	5	1	1	3	0	0
December	2	0	0	1	0	1

Table 2. Monthly changes in the testicular cycle of 27 *Pachydactylus capensis* from southern Africa.

Month	*n*	Recrudescence	Early spermiogenesis	Full spermiogenesis
January	4	0	0	4
February	3	1	0	2
March	1	1	0	0
April	6	6	0	0
June	3	1	2	0
July	5	1	2	2
September	1	0	0	1
October	4	0	0	4

larged follicles (> 3 mm length) were present in August, October, December, January and February indicating clutches could be produced over a 7-month period. This is longer than the reports of De Waal (1978) that gravid females were found from September to November, Visser (1984) and Branch (1998) that eggs are laid from September to December and Bates (1991) that gravid females were collected from November to February. Pianka and Huey (1978) reported gravid *P. capensis* from December and January. Mean clutch size for eight females with enlarging follicles (> 3 mm length) was 1.9 ± 0. 35, range = 1-2. This compares to the same value (1.9 ± 0.3) for 92 females with oviductal eggs in Pianka (1986).

Data on the seasonal testicular cycle are presented in Table 2. *Pachydactylus capensis* males follow a testicular cycle in which sperm formation (spermiogenesis) begins in late autumn and is completed in late summer. The stage of spermiogenesis was divided into "early spermiogenesis" in which small clusters of sperm lined portions of lumina of the seminiferous tubules with occasional groups of metamorphosing spermatids present and "full spermiogenesis" (Table 2) in which dense clusters of sperm lined the seminiferous tubules and 4–5 layers of metamorphosing spermatids were present. *Pachydactylus capensis* males in early spermiogenesis were found in June and July (late autumn and winter). Males in full spermiogenesis were found in July, September, October, January and February (winter, spring and summer). In this male reproductive strategy the testicular cycle goes through recrudescence (= renewal of germinal epithelium) in autumn and winter so that by spring, males are able to commence breeding. The smallest mature male (spermiogenesis in progress) was from July and measured 45 mm SVL (LACM 82934).

In a study on reproduction of the congener *Pachydactylus bibronii* from South Africa, Flemming and Bates (1995) reported males exhibited peak spermiogenesis in July–November (midwinter to late spring). *Pachydactylus bibronii* with regressed testes (only spermatogonia present) were seen in January to March. No *P. capensis* males with regressed testes were found, perhaps due to my small sample sizes. Testes in recrudescence were noted January to April in *P. bibronii* indicating a summer–fall recovery period and males ready for breeding (maximum spermiogenesis in spring) as occurred in *P. capensis*.

Southern Africa has a diverse gekkonid fauna consisting of 89 species in 15 genera (Branch, 1998). Subsequent studies on different species are needed to determine the variation in the reproductive cycles of the geckos of southern Africa.

Acknowledgment

I thank Christine Thacker (LACM) for permission to examine *P. capensis*.

Literature Cited

Auerbach, R. D. 1987. The amphibians and reptiles of Botswana. Gaborone, Botswana: Mokwepa Consultants.

Barts, M., A. Bauer, R. D. Babb, F. Tillack and W. D. Haacke. 2002. Die dickfingergeckos des südlichen Afrikas Teil II. haltung und vermehrung des gebänderten dickfingergeckos, *Pachydactylus fasciatus* Boulenger, 1888. Sauria, Berlin 24:3-8.

Bates, M. F. 1991. Reproductive data on the Cape thick-toed gecko, *Pachydactylus capensis capensis* (A. Smith, 1845). Journal of the Herpetological Association of Africa 39:6-7.

Branch, B. 1998. Field guide to snakes and other reptiles of southern Africa. Sanibel Island, Florida: Ralph Curtis Books.

De Waal, S. W. P. 1978. The Squamata (Reptilia) of the Orange Free State, South Africa. Memoirs Van Die Nasionale Museum 11: 1-160.

Flemming, A. F., and M. F. Bates. 1995. Male and female reproductive cycles of Bibron's gecko *Pachydactylus bibronii* (Sauria: Gekkonidae) in the Free State Province of South Africa. Journal of African Zoology 109:409-422.

Loveridge, A. 1972. Revision of the African lizards of the family Gekkonidae. Bulletin of the Museum of Comparative Zoology 98: 1-469.

Pianka, E. R. 1986. Ecology and natural history of desert lizards: Analyses of the ecological niche and community structure. Princeton, New Jersey: Princeton University Press.

Pianka, E. R., and R. B. Huey. 1978. Comparative ecology, resource utilization and niche segregation among gekkonid lizards in the southern Kalahari. Copeia 1978:691-701.

Visser, J. D. 1984. Kalahari geitjies kan ook warm kry! Landbou Weekblad 325 (May 4):48, 49, 51.

Bull. Chicago Herp. Soc. 41(6):107, 2006

Book Review: *Amphibians of East Africa* by Alan Channing and Kim H. Howell 2006. 411 pp. Ithaca, NY. Cornell University Press. ISBN-13: 978-0-8014-4374-9

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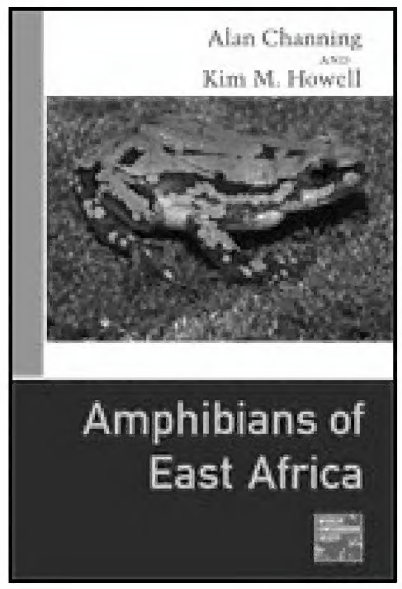

This book represents the first comprehensive field guide and reference book to East African amphibians since a checklist published in 1957 by A. Loveridge. *Amphibians of East Africa* is a welcome addition to the growing African herpetological library and an impressive documentation of its diverse amphibian assemblages. This book is useful for all students and researchers in herpetological study, conservation organizations as well as hobbyists and enthusiasts. It serves as a companion to Alan Channing's *Amphibians of Central and Southern Africa* (2001) and as a first step towards providing baseline knowledge of East African amphibians.

The introduction begins by identifying the need for knowledge on African amphibians and provides a guide for students to learn about the biology of and gain familiarity with the 203 extant amphibian species in East Africa. It provides a summary of the book's arrangement, mentions the use of keys to aid in identification, and gives a detailed layout of the species accounts. Also included is an explanation of map compilation, and possible pitfalls in the mapping technique. Additional sections in the introduction pertain to the usefulness of natural history museums in cataloguing biodiversity and methods for collecting amphibians.

Chapters on "History of Amphibian Studies in East Africa," "Geography and Environment," and "Conservation" are short and to the point. Currently, 52 East African species are listed by the Global Amphibian Assessment (GAA) as threatened. A table is given to illustrate those species and their IUCN status. Moreover, information is provided on the threats to amphibian populations and the efforts and strategies to be taken to thwart the decline. However, the authors don't specifically state what East African countries are now doing to protect regional diversity. Maps showing major geographic features, annual rainfall, and vegetation groups are included in the geography chapter. However, the maps could have been detailed better. Grayscale without patterns or striping makes it difficult to discern the different groupings. Also, the area covered by Tanzania, Uganda and Kenya was not disclosed, nor its relation to the African continent, which would have given scale to the area (East Africa).

The dominant section (335 pages) is the description of 194 frogs and 9 caecilians, including information and a key to known tadpoles. The GAA as of June 2006, reports 205 anurans and 10 caecilians, so the book is extremely close to the official count. In many of the accounts the authors point out where new species are being found and/or await description during preparation of the book. Descriptions are supplemented with 24 plates consisting of 185 clear color photographs of almost every species, some eggs and larvae, behavior, and one habitat. Identification keys are broken into families, genera, and species, with 74 helpful drawings to assist in identification, and 202 distribution maps. Definitions and explanations for terminology and characters used in both the adult species key and tadpole keys assist identification. Familial sections provide knowledge of key features, behavioral observations, habitat associations, and genera included. Generic sections imply diversity, habitat associations, description of reproductive mode, and number of species in clade. Individual species accounts include etymology, common names, a description of appearance, habitat and distribution, advertisement call description, breeding (reproductive activity), any additional notes on biology of species, and key references. These topics are easily followed but often exhibit gaps in knowledge. For example, components of life history (breeding, tadpoles, and some advertisement calls) are lacking for many species. This is not a failure of the authors but a beacon for investigation. The maps display "only localities where the species is known to occur, and not all the localities where the species does occur." In other words knowledge of the distribution of most species is incomplete.

Following the species accounts, a chapter on tadpoles explains their importance in the ecosystem and the need for additional collection. I was pleasantly surprised that this section was included as many books conveniently leave out tadpole characterizations.

Ending the book is a section for the Swahili reader, which is a respectful gesture to encourage and support local involvement in the exciting diversity beyond their front doors. The book is affordable and within the retail price range of similar books. This book is excellent for the general reader and a must-have for a specialist working in Africa or with amphibians. However, the hard cover makes it difficult to carry in the field. It is concise and informative on the overall biology of the amphibians of East Africa, including conservation and research status.

Literature Cited

Channing, A. 2001. Amphibians of central and southern Africa. Ithaca, New York: Cornell University Press.

Loveridge, A. 1957. Check list of the reptiles and amphibians of East Africa (Uganda; Kenya; Tanganyika; Zanzibar). Bull. Mus. Comp. Zool. 117(2):153-362 + xxxvi.

HerPET-POURRI
by Ellin Beltz

Cheaper than mice

Implicated in the spread of chytrid fungus worldwide, African clawed frogs, *Xenopus laevis*, are in the news for another reason. "According to . . . investigators at the University of Edinburgh . . . analysis of the amphibians . . . revealed that the distinctive species—which has become popular in recent years as a domestic pet—shares with humans the same genetic mechanism that enables embryonic stem cells to divide without limit. Researchers found that the embryonic stem cell research allows the extracted cells to become any of the 200 cell types in the body. Until now, stem cells have been obtained from mice, primates and humans, but never from amphibians. However, the African clawed frog is easier to study than mice and humans." [*All Headline News*, London, England, May 15, 2006, from Wes von Papineäu]

Are they speciating, or have we learned to look?

The former Bronx Zoo, the New York-based World Conservation Society, discovered eight new species of frogs in the past two years in Laos. Keep your eyes out for pictures of these; a couple are really unusual. [*Yahoo News*, May 2, 2006, from Carl Harlow and Ms. G. E. Chow]

Ready, set, breed!

• Sometimes one needs to believe everything one reads. Several articles lately have pointed to the arrival of Bahamian northern curlytailed lizards in Fort Lauderdale, Florida, as the "next wave of invaders." The hype approaches Spielbergian proportions with biologists calling them "the *T. rex* of little ground creatures." Their first arrival was in Palm Beach when a man let 40 of them loose to eat bugs in his sugar cane fields. By 1968, the lizards had crossed to the mainland and have spread outward ever since. One researcher says that where they are found, no other lizards are found, another called them "ferocious little carnivores," and added, "They do well around humans." [*Lansing State Journal*, May 7, 2006, from Jim Harding]

• Brown anoles have arrived in Hawaii. "They're ugly; they look like little dinosaurs," said an Hawaii Kai resident. "I take my dogs out for a walks in the afternoon and they're just all over the sidewalks." A representative of the Department of Agriculture said the first reports of brown anoles date back to the 1990s. Since then other lizards have disappeared across Oahu, parts of Kauai and Maui. Geckos and smaller green anoles are on the menu. [KHON, Honolulu, Hawaii, May 2, 2006] Contributor Ms. G. E. Chow wrote, "They're not that bad. . . . They'll eat out of your hand if you give them the chance."

• A 17-inch albino corn snake was found and captured by a new resident of Hawaii who used to live in the Midwest and was confident enough to catch it alive. At first he thought the brightly colored animal was a rubber snake someone had tossed on his patio, but as he got closer, he noticed activity. It was turned in immediately to the Department of Agriculture. Ownership of snakes is strictly prohibited in Hawaii. [*Honolulu Star-Bulletin*, March 11, 2006, from Ms. G. E. Chow]

• "Invasive species should be high on the list [of things searched for and found at Hawaiian airports], not an afterthought. It's not a priority until we have frogs chirping in the neighborhoods, and then we dump all sorts of money on it." Jeff Mikulina, Sierra Club Hawai'i Chapter. [*Honolulu Weekly*, April 12-18, 2006, from Ms. G.E. Chow]

The month of the Crocodile Story

• "A woman found a small [freshwater] crocodile in her backyard swimming pool in Sydney . . . just weeks after a saltwater crocodile was found in a nearby pond. The freshwater species, which can grow up to 10 feet in length, is not found in the wild anywhere near Sydney." [*Honolulu Star-Bulletin*, March 19, 2006, from Ms. G. E. Chow]

• One of the tropical storms to hit Australia this year caused a tree to fall against an enclosure housing a 14½-foot crocodile. When a worker came to remove it, the chain-saw noise apparently upset the animal which "jumped out of the water and sped along the tree about 18, 20 feet and actually grabbed the chain saw out of his hands," according to an eyewitness. The worker was unhurt, but the saw, after being chewed on for 90 minutes, is finished. Associated Press calmly concluded "Saltwater crocodiles have been known to attack small power boats, apparently because they do not like the noise of outboard motors." [*Sun-Sentinel*, April 30, 2006, from Alan W. Rigerman]

• Another tropical storm over-washed the Northern Territory town of Katherine and left crocodiles floating in all sorts of inconvenient places. A teenage boy who took shelter in a tree was attacked by, and then left alone, by a crocodile. Parks and Wildlife sent an experienced Crocodile Hunter into the area to shoot the more dangerous animals. [*The Honolulu Advertiser*, April 16, 2006, from Ms. G. E. Chow]

• "Hunters capture a nine-and-a-half foot alligator that they believe killed a Florida woman. . . . Authorities believe they have found and killed the alligator responsible for the death of a 28-year-old aspiring model this week after hunters found two human arms in the animal's stomach. The male alligator was 9 feet, 6 inches long, Florida Fish and Wildlife officials said. . . . [She was] the 18th person killed by alligators in Florida since 1948." [*Yahoo News*, May 13, 2006, from Marybeth Trilling] Right after that, I heard there were two more people killed by alligators, but I'm waiting for the clippings which will eventually fill in al the details.

Would you like frogs with that?

Associated Press reports: "A woman eating a salad at a Burger King restaurant in the Netherlands found a live frog in her salad, the company confirmed. . . . [The woman] said she found the amphibian while halfway through her meal at the Burger King restaurant at The Hague's central train station. 'I stood up and screamed the place upside-down,' she told [Dutch

newspaper *Algemeen Dagblad*]. . . . The company had given its excuses and is trying to figure out how the frog got into the salad." [June 3, 2006, from Ms. G. E. Chow]

Early Muppet Trivia

Adam Finley wrote: Many years ago I was watching a special on Jim Henson that showed a lot of the work he had done before *The Muppet Show* came along and gave him that final push into the mainstream he was already essentially a part of anyway. Besides his work on shows like *Sesame Street*, *Sam and Friends*, and *The Muppet Show*, Henson's puppets also appeared in several commercials, including . . . Wilkins Coffee. I believe there were several of these commercials made, all of which ended with one puppet being shot with a cannon for refusing to try Wilkins Coffee. [Kermit is the narrator in the clip posted on the website.] I guess the point was that if you didn't at least try it, a small amphibian would shoot you in the face with heavy artillery. [June 1, 2006, a disappointing film clip is posted at http://www.adjab.com/2006/06/01/drink-coffee-or-face-muppet-death/]

Plane Snake (sp. nov.)

Well, no sooner does Hollywood come up with the much anticipated summer blockbuster "Snakes on a Plane," than a real, live snake gives the idea a twirl. The snake slithered on board a Piper Cherokee while it was on the ground in Charleston, West Virginia, and emerged from the instrument panel at about three thousand feet above southern Ohio. The pilot grabbed the snake with one hand, while flying the plane with the other, then radioed down for fast landing clearance—which he received—made a smooth landing, posed for pictures and let the snake go. Let's hope the Hollywood story is as kind to the creatures but I have my doubts. [*Yahoo News*, June 2, 2006, from Ms. G. E. Chow]

Frogs on the Plane

"In a race to save amphibians threatened by an encroaching, lethal fungus, two conservationists from Atlanta recently [legally] packed their carry-ons with frogs rescued from a Central American rain forest—squeezing some 150 to a suitcase—and requested permission from airlines to travel with them in the cabin of the plane. . . . They didn't do any studies, instead over-collecting individuals and bringing them to the U.S. for breeding purposes. Not all experts, it should be noted, are fans of what has come to be called the rapid response protocol. . . . Still, in an apparent validation of their tactics . . . [the lead scientist] said the chytrid fungus had recently been found in El Valle, as predicted, and he estimated 90 percent of the frogs there would be gone within 90 days. 'You won't hear scientists say this too often,' [he] said. 'But I wish we were wrong.'" [*New York Times*, June 6, 2006]

Turtles move, man gets life

A New Yorker who kept more than 1,000 turtles in his 3,500 square foot loft, hosting school tours and newspaper reporters for years, has decided the turtles are going to a turtle preserve across the Hudson in New Jersey. "What will change? Aside from having a lot of space back, [he] will have another $5,000 a month to his name—that's how much it takes to feed and care for those critters. [*The Honolulu Advertiser*, April 20, 2006, from Ms. G. E. Chow]

How to not get bitten

"Last year, about 250 bites—from all kinds of snakes as well as poisonous insects and other pests—were reported to the Miami-Dade Fire Rescue Venom Response Unit. Of those, 92 were from poisonous snakes and needed antivenin treatment. The unit has the only bank of its kind of exotic antivenin in the nation. The facility stocks 43 types of antivenin, four for native species and the rest for exotic snakes, mostly kept by zoos, handlers and private collectors. The typical snakebite victim is a 'male between 17 and 27,' the Massachusetts Medical Society wrote in 2002. 'Ninety-eight percent of bites are on extremities, most often the hands or arms, and result from deliberate attempts to handle, harm or kill the snake.' Experts offer simple advice: If you see a snake, don't touch it. 'If we could keep the 14- to 45-year-old "boys" from picking up snakes, we could drastically reduce snakebites,' said Lt. Charles Seifert of the Miami-Dade Anti Venom Bank." [*Sun-Sentinel*, June 5, 2006, from Bill Burnett]

More animals out of place

- Many restaurants in the Beijing area are noticing a downward trend in eating wild-caught food and so have begun letting tanks full of snakes, guinea pigs and other small animals loose in the fields outside of town. "Large numbers of snakes were freed in May, including many poisonous species. . . . Villagers in Dazhuangke Village of Yanqing County told the *Beijing Daily* that at the end of May more than ten individuals drove to the village with 3 big bags of snakes. With the bags unpacked more than 200 snakes were freed, villagers said. The estimated 200 snakes then dispersed into the nearby fields and orchards leaving the villagers in fear of attack, and unable to bring in the harvest. . . . Freeing captive animals is a Chinese tradition several thousand years old. Chinese people, especially Buddhists, think that through good deeds such as freeing captive creatures, they will benefit in the afterlife. In recent years, the action of freeing animals at random, regardless of the result, has been criticized by some Buddhists and environmental protection experts." [*Interfax-China*, June 2, 2006]

- The second-largest Nile monitor caught in Cape Coral, Florida, since trapping began in 2001 measured a whopping 6 foot 2 inches of pure mean. The biggest one ever caught there was 6 foot 3 inches. [*The News-Press*, June 2, 2006, from Wes von Papineäu]

- "European wall lizards—descendants of a few creatures imported from overseas in 1951 by a vacationing Hyde Park boy." Now grown, he describes the why and the how of introducing European wall lizards to the Cincinnati area. The *Ohio Enquirer* [May 21, 2006] reports, "He caught the lizards at Lake Garda in northern Italy. He brought some back to his father's house in Switzerland, where he was staying for part of the summer. . . . He decided to bring some back to Cincinnati, where he lived with his mother. . . . 'I put about 8 or 10 of them in a sock and put it in my pocket before I got on the plane,'" the now much older man said. His brother even tried

to move a few to Maryland, but they didn't establish. A second translocation of a few individuals from El Vedra introduced a blue-bellied form which interbred with the Lake Garda stock producing the current "Cincinnati Wall Lizard" which is migrating—of course—having reached northern Kentucky. No native lizards are apparently displaced by the Europeans.

Indian Cane Turtle renamed

A Madras Snake Park press release picked up by *New Delhi News*, June 5, 2006, reports: "India's first woman herpetologist, J. Vijaya, has finally got her due. Nearly two decades after she was found dead, at the age of 28, her name has been formally given to the cane turtle that she spent so much of her time studying. . . . Herpetologists [who] analyzed the DNA . . . renamed the turtle *Vijayachelys silvatica* in her honor. It is a monotypic genus, which means that there is no other turtle like it to share the name of *Vijayachelys*. Young Viji came to Madras Snake Park as a volunteer in late 1978 and after graduation started working full-time here. Romulus Whitaker, her boss at the Madras Snake Park, put her onto freshwater turtles and later when Edward Moll, Chairman of the World Conservation Union's Freshwater Chelonian Specialist Group needed an assistant for a nationwide survey of turtles Whitaker recommended Viji, who was just 22, for the job, says the magazine. The survey got underway in August-September 1981 and Viji travelled up to West Bengal (the major consumer of freshwater turtles in the country) to meet up her team members. They began their work from the meat markets; here thousands of Indian softshell turtles and narrow-headed soft-shell turtles came for sale during the winter months. The price of turtle meat plummeted from Rs. 18 to Rs. 5 per kilogram during these months; 'It was cheaper than beef,' Viji noted. What Viji was doing wasn't easy. The areas she visited for her work were the 'wild west' of India and the black-and-white pictures she took of the gory sea turtle slaughter on Digha beach in West Bengal and in the meat markets of Calcutta, shook the public when *India Today* magazine ran them in the early 1980s. According to the magazine, Prime Minister Indira Gandhi took action and overnight sea turtle exploitation was cut to a trickle. . . . She was finally able to find a cane turtle in July 1982 and that shot her into the international limelight. In December 1982, one of the female cane turtles Viji brought back laid a clutch of two eggs. She also discovered that this species wasn't a vegetarian as earlier thought and from knowing virtually nothing about it, Viji made a quantum leap in documenting what this turtle was about, says the magazine. Completely at home in the forest, Viji is remembered as an excellent field biologist whose best traits were her perseverance and her ability to observe. In 1984 she was invited to do her Masters from the Eastern Illinois University and in 1987 returned to India to do field studies. She was found dead in the forest she loved."

Arribada!

A record number of 76 Kemp's ridley nests have been found at the Padre Island National Seashore this year, up from 51 in 2005, and the greatest number since they began nesting after massive efforts to head-start and restore the species. When the first Kemp's ridleys were released off Padre Island, no one knew if they would come back and since it takes about 15 years for turtles to mature to egg-laying age, it was many years before the first turtle came home to roost. Volunteers patrol miles and miles of beaches, but often visitors are the first to see a nest because the turtles lay fast and get out. [*Texas Gulf Caller-Times*, June 3, 2006, from Wes von Papineäu]

Thanks to everyone who contributed this month, especially Bill Burnett, Ms. G. E. Chow, Wes von Papineäu, Alan Rigerman, Marybeth Trilling and the wonders of Internet news services. After all these years of saying, print only, I encourage new contributors particularly to send the text of stories in the body of an email (please not the link alone!) to my email address: ebeltz@ebeltz.net. Print articles, those with great photos, great postcards, interesting pictures, personal notes, and other fascinating things may be sent to: Ellin Beltz, POB 1125, Ferndale, CA.

A special thanks in advance to the Pacific Northwest Herpetological Society and long-term contributor Marty Marcus for inviting me to speak at their June 2006 meeting in Washington State. Finally, after all these years, I'll get to meet someone who's been contributing to this column for over a decade!

Bull. Chicago Herp. Soc. 41(6):111-114, 2006

Herpetology 2006

In this column the editorial staff presents short abstracts of herpetological articles we have found of interest. This is not an attempt to summarize all of the research papers being published; it is an attempt to increase the reader's awareness of what herpetologists have been doing and publishing. The editor assumes full responsibility for any errors or misleading statements.

THE YELLOW MUD TURTLE IN ILLINOIS

M. W. Tuma [2006, Chelonian Conservation and Biology 5(1): 108-120] notes that the yellow mud turtle (*Kinosternon flavescens*) is a xerothermic relict partially distributed among several disjunct populations on sand prairies along the former Prairie Peninsula in Illinois, Iowa, and Missouri. In Illinois, where the species is listed as endangered, the largest known population occurs at the northeastern extent of the species' range in Henry County. A major portion of the site is in private ownership, and the Illinois Department of Natural Resources seeks to acquire additional mud turtle habitat to supplement a 1998 acquisition that was designated as a preserve. To determine additional preserve acquisition area, identify critical habitat, and recommend management techniques, data regarding the range, habitat use, and seasonal activity of turtles at this location were collected through radiotelemetry, aquatic trapping, and drift fence captures. Eleven adult mud turtles (6 males, 5 females) were fitted with radio transmitters and tracked between 12 May 1992 and 6 June 1993. Radiotagged turtles occupied ephemeral ponds between mid-April and late May, and estivated in sand dunes in June and July. Some emerged for a second aquatic activity period in the ponds in July and August. Hibernation occurred in sand dunes from September through mid-April. Aquatic trapping and drift fence captures of adults and juveniles confirmed similar schedules of activity, estivation, and hibernation observed in the telemetered individuals. Drift fence captures of hatchlings indicated emergence from nest locations from early May through June. A lack of hatchling captures in midsummer suggests that hatchlings remained in ponds or dried pond beds through the summer. Important aquatic habitat identified during the study included shallow ponds with soft, muddy substrates and dense emergent vegetation; important terrestrial habitat included sand dunes with an elevation of at least 15 feet above the ponds. Telemetered adult mud turtles burrowed into sand dunes at locations of up to 90 m from pond edges. Females oviposited at nest locations up to 70 m from pond edges. Nest predators included coyotes (*Canis latrans*), striped skunk, (*Mephitis mephitis*), and western hognose snake (*Heterodon nasicus*). The recommended area for the preserve addition includes a buffer of terrestrial habitat to a distance of 90 m from maximum pond level edges. Additional preserve design recommendations include constructing a bridge or culvert under a road that bisects the site so that turtles can move between aquatic and terrestrial habitats on each side of the road, and encouraging native shortgrass prairie vegetation in acquired areas. Other recommendations include periodic introductions of hatchling mud turtles from a nearby, appropriately identified population, predator management techniques that encourage hatchling recruitment, and conducting habitat management activities with the potential to disturb soils between November and March.

NEW PERUVIAN HARLEQUIN FROG

S. Lötters et al. [2004, Revista Española de Herpetologí a 18: 101-109] explain that several undescribed species of harlequin frogs, genus *Atelopus*, are known from the Amazonian slopes of the Andes in Peru. Most of these have restricted distributions. This paper describes one such species, known from a single site in the eastern Andes of northern Peru, and names it *Atelopus epikeisthos*. The new species is similar to *A. angelito*, *A. bomolochos*, *A. dimorphus*, *A. eusebianus*, *A. exiguus*, *A. muisca*, and *A. peruensis* by having a uniform green dorsum. The new species can be distinguished from the above on the basis of adult size and dorsal skin texture. The male holotype of the new species has a snout-vent length of 38.2 mm and warts on the dorsum. Applying IUCN Red List criteria, the authors categorize the new species as critically endangered. The specific name is a Greek adjective meaning "threatened through adverse circumstances" and refers to its conservation status.

MOST PRIMITIVE SNAKE FOSSIL

S. Apesteguí a and H. Zaher [2006, Nature 440:1037-1040] note that it has commonly been thought that snakes underwent progressive loss of their limbs by gradual diminution of their use. However, recent developmental and palaeontological discoveries suggest a more complex scenario of limb reduction, still poorly documented in the fossil record. Here we report a fossil snake with a sacrum supporting a pelvic girdle and robust, functional legs outside the ribcage. The new fossil, from the Upper Cretaceous period of Patagonia, fills an important gap in the evolutionary progression towards limblessness because other known fossil snakes with developed hindlimbs, the marine *Haasiophis*, *Pachyrhachis* and *Eupodophis*, lack a sacral region. Phylogenetic analysis shows that the new fossil is the most primitive (basal) snake known and that all other limbed fossil snakes are closer to the more advanced macrostomatan snakes, a group including boas, pythons and colubroids. The new fossil retains several features associated with a subterranean or surface dwelling life that are also present in primitive extant snake lineages, supporting the hypothesis of a terrestrial rather than marine origin of snakes.

REVIEW OF THE SHIELD COBRAS

D. G. Broadley and A. S. Baldwin [2006, Herpetological Natural History 9(2):163-176] note that the southern African elapid genus *Aspidelaps* remains poorly understood in most aspects of its biology. The available information is sparse and often only published via anecdotal notes in obscure journals or out-of-print books. The review presented here is not comprehensive in respect to many historical herpetological surveys of the southern African region, but provides a compilation of updated taxonomic, ecological, behavioral, zoogeographical and toxicological information, including notes on captive husbandry.

ISLAND VERSUS MAINLAND BOA CONSTRICTORS

S. M. Boback [2006, Copeia 2006(2):261-267] reports that relative to mainland *Boa constrictor*, boas from islands off the coast of Belize have been described as being smaller, having longer tails, more elongate snouts, and proportionately larger eyes. However, no systematic confirmation of these patterns has been made. A morphometric study was initiated to investigate the body size and head shape variation between island and mainland boas in Belize. One hundred twenty-nine boas from five islands and the mainland were caught and measured. Univariate and multivariate analyses indicated that, in general, previous descriptions are accurate. Island boas are about half the length and one-fifth the mass of mainland boas. In contrast to mainland boas, no sexual size dimorphism is evident in island boas. The head shape of island boas differs from that of mainland boas but this divergence is not consistent among populations. Some island boas have more attenuate snouts compared to mainland boas whereas other island boas have larger eyes and narrower heads. Male island boas have longer tails compared to males from the mainland, but such a difference is not found in females from the two localities. The morphology of island boas is consistent with an arboreal habit and reduced prey size. Because these changes have occurred over an extremely short time interval, this may be another example of the speed and magnitude of adaptation that is possible in squamates.

CONSERVATION STATUS OF THE NEGEV TORTOISE

J. Perälä [2006, Chelonian Conservation and Biology 5(1): 57-66] notes that the Negev tortoise, *Testudo werneri*, is one of the smallest tortoise species in the Mediterranean region, with a historical distribution in northeastern Egypt, Sinai, and parts of the Negev desert in Israel. Populations in Egypt are already practically extinct due to anthropogenic factors affecting the habitat and collection for the pet trade. Currently, *T. werneri* has a national Israel Red List status of Endangered (EN, A2cd, B). The species' primary habitat, desert sands, is degrading rapidly because of a multitude of human induced factors. Other threats include unnatural predators attracted by human settlements, and collecting for food and pet trade. According to present estimates, the global population has declined by around 95% in less than three generations. The remaining *T. werneri* population is essentially restricted to an area of around 700 km^2 or less in northwestern Negev, Israel. Ten individuals are known from Zaranik in northern Sinai of Egypt. The present population size is estimated at between 2520 and 3150 individuals depending on parameters used, of which around 1890 to 2360 tortoises would be adults. True figures may be considerably less, however. *Testudo werneri* is clearly threatened by extinction, potentially within decades, but more data are needed for an accurate estimate. The establishment of new nature reserves in the sands of northwestern Negev in conjunction with effective management would enhance the survival prospects of the species, assuming that most of the known threat factors can be addressed. *Testudo werneri* qualifies globally for listing as Critically Endangered (CR, A2abcde+ 3de) under current IUCN Red List Criteria; this was recommended and accepted by the IUCN in 2003.

MASSASAUGA HIBERNATION SITES

D. S. Harvey and P. J. Weatherhead [2006, J. Herpetology 40(1):66-73] note that hibernation sites at higher latitudes must protect snakes from colder conditions for longer periods of time. Because fewer locations are likely to be suitable, hibernation site availability may restrict the northern distribution of snakes. The authors considered overwinter mortality, hibernation site fidelity, and the abundance of suitable hibernation sites based on surface features to assess whether massasauga rattlesnakes, *Sistrurus c. catenatus*, are likely to be limited by hibernation site availability on the Bruce Peninsula, Ontario, Canada. Three years of radiotelemetry were used to locate 46 hibernation sites of 32 individual snakes. Snakes hibernated individually in old root systems, rodent burrows, and rock crevices in forested areas. Hibernation sites could be differentiated from forested areas generally available to snakes but not from locations with holes and crevices in the immediate vicinity of hibernation sites. Few snakes hibernated in the same location in consecutive years, although most (> 70%) hibernated within 100 m of their previous location. Overwinter mortality over three years (23%) was similar to mortality during the active season (21%). These results suggest that massasauga rattlesnakes may be limited by the availability of suitable hibernation sites, but sites of similar quality to those used by overwintering snakes are locally abundant. The location of hibernation sites within forests could not be predicted reliably based on surface features. Therefore, efforts to conserve habitat for this threatened species should consider all forested areas on the Bruce Peninsula as potential hibernation habitat.

LEOPARD TORTOISE THERMOREGULATION

M. K. McMaster and C. T. Downs [2006, Herpetologica 62(1):37-46] note that behavioral thermoregulation is used by tortoises (Family Testudinidae) to moderate the effects of daily and seasonal fluctuations in ambient temperature on their body temperature. Extensive use is made of refuges to facilitate this behavioral thermoregulation. The Nama-Karoo in South Africa experiences wide temperature fluctuations both daily and seasonally. The authors investigated the seasonal use of refuges by the leopard tortoise (*Geochelone pardalis*) and the orientation of the tortoises within the refuges. Turtles used a wide variety of refuges, with *Lycium* spp., *Eberlanzia ferox*, *Opuntia ficus*, and grass clumps being preferred. Seasonal variation in the use of these refuges depended on whether the refuges were used as forms or shelters. Tortoises in spring and winter often remained in the same refuge for the entire season or returned to the same refuge on consecutive nights. Seasonal and behavioral variation was found in (a) the orientation of the tortoises within a refuge, and (b) the portion of the shell of each leopard tortoise within a refuge that was exposed to solar radiation. Tortoises in winter and spring maximized the amount of solar radiation received on their shells, while tortoises in summer and autumn minimized the solar radiation received. Consequently, using a combination of refuge type and body orientation, leopard tortoises appear to passively thermoregulate and thus control for temperature fluctuations experienced in an extreme environment.

BURN REGIMES AND HERPETOFAUNA

D. J. Wilgers and E. A. Horne [2006, J. Herpetology 40(1): 73-84] report that the Flint Hills region of Kansas is the largest contiguous area of tallgrass prairie remaining today. Historically, the tallgrass prairie burned every 2–3 yr on average, but current land managers have altered burn regimes, resulting in a range of habitats from annually burned to long-term unburned. The authors used drift fence/funnel trap arrays and coverboards to estimate species richness, evenness, and diversity of herpetofauna within three different burn regimes: annual, 4-yr, and long-term unburned at Konza Prairie Biological Station, Riley County, Kansas. During the spring and fall of 2003–2004, 315 individuals from 20 species were captured across all burn regimes. Herpetofaunal species richness, evenness, and diversity estimates were not different between the three burn treatments. However, because of species-specific responses to individual burn regimes, community composition was significantly different between the habitats ($\chi^2 = 158.19$, df = 20, $P < 0.001$). Four species exhibited preferences among burn regimes, which differed significantly from independent assortment, with *Eumeces obsoletus* and *Phrynosoma cornutum* preferring annual burn treatments, *Scincella lateralis* preferring 4-yr burn treatments, and *Diadophis punctatus* preferring long-term unburned treatments. Species-specific responses were likely because of changes in vegetation structure and microhabitat (temperature and moisture content) created through different frequencies of fire disturbances. Maximizing large-scale herpetofaunal diversity across the Flint Hills' rangelands could be accomplished by creating a large number of small scale habitat types through a mosaic style burning plan.

ALLIGATOR SNAPPING TURTLES IN LOUISIANA

J. Boundy and C. Kennedy [2006, Chelonian Conservation and Biology 5(1):3-9] trapped 200 alligator snapping turtles at an average rate of 0.057 turtles per trap-night in all but 1 of 33 sites in southeastern Louisiana. Trap rate varied between sites, by harvest pressure levels at sites, and by season, but not by hydrology. Perceived trap rate differences under different harvest regimes appeared to be a function of seasonal differences in trap rate. No differences in sex ratio or percentage of immature turtles were detected among sites, harvest regimes, seasons, or water-body types. Turtle weight varied among harvest regimes and hydrology. Weight and length for turtles were highly correlated and their relationship was similar between sexes, except that males continued to grow to larger sizes than females (males averaged 150% female weight and 118% female carapace length). Sex ratio was 1:1, and immature turtles made up 48% of the total. Average sizes of turtles were very similar between Louisiana and turtles from surveys in several other states. Population structure differed between surveys, with Louisiana having a higher percentage of immature turtles and lower trap rate than elsewhere. Population differences could not entirely be explained by differences in harvest regimes between states. Large-scale turtle butchering operations in southern Louisiana have closed, as has commercial harvest. Anecdotal reports that alligator snappers were nearly extirpated from a heavily harvested site proved erroneous. Resurvey of sites to determine current population trends is recommended.

CRICKET FROG DECLINES

R. M. Lehtinen and A. A. Skinner [2006, Copeia 2006(2):159-167] note that Blanchard's cricket frogs (*Acris crepitans blanchardi*) are geographically widespread and historically common, yet are in decline throughout much of the northern part of their range. One proposed mechanism for this decline is the negative effects of acidified precipitation on this acid-sensitive species. To test the predictions of this hypothesis, the authors sampled 570 randomly-selected sites along three transects in Ohio using chorusing surveys during 2004. Along these transects, pH and acid neutralizing capacity (alkalinity) were assessed, as well as terrestrial and aquatic vegetation cover. The surveys detected 53 extant cricket frog populations (9.3% of surveyed sites) in ponds, lakes, and streams. These sites were exclusively located in western Ohio, indicating a substantial (120 km) range contraction, compared to its historic distribution in the state. A multiple logistic regression model found no significant relationship between cricket frog occurrence and either pH or acid neutralizing capacity ($P > 0.50$). Acid neutralizing capacity and pH were also not significantly different in extant and extinct areas of the cricket frog's range in Ohio ($P > 0.05$). Cricket frogs were found to occur significantly more frequently than expected by chance in lakes and at sites with low canopy cover ($P < 0.001$). While synergistic interactions with other factors cannot be ruled out, these results suggest that habitat acidification is likely not responsible for cricket frog declines in Ohio. Unlike other declining amphibians, where likely causal mechanism(s) have been identified, causes of cricket frog declines remain enigmatic.

CHORUS FROG COURTSHIP CALLS

P. C. Owen and J. K. Tucker [2006, Copeia 2006(1):137-144] studied the courtship behavior of two species of chorus frogs, *Pseudacris illinoensis* and *P. triseriata*, in western Illinois. The authors report observations of courtship behavior and describe courtship calls for each species. These calls were given in response to both male and female conspecifics entering the calling spaces of resident males. Courtship calls given in response to an intruder were never followed by aggressive behaviors from the resident or the intruder, and courtship calls were never given in response to playbacks of conspecific advertisement calls. Thus, these calls do not appear to be used in an aggressive context. Courtship calls of *P. illinoensis* are longer in duration than advertisement calls. Courtship calls in *P. triseriata* consist of multiple notes compared to single note advertisement calls. These courtship calls have higher pulse rates and lower dominant frequencies, and they are given at faster calling rates than advertisement calls. Courtship calls of both species are more variable in structure within males than advertisement calls. Like two other species of chorus frogs for which courtship calls have been reported, courtship calls in *P. illinoensis* and *P. triseriata* are modifications of the advertisement call. Courtship calls in the genus that have been described so far do not appear to share a common structure. The recognition of courtship calls in a chorus may play a useful role in long-term monitoring of anuran breeding activity, especially in remotely determining the presence of gravid females.

SLIMY SALAMANDER NESTING BEHAVIOR

S. E. Trauth et al. [2006, Herpetological Natural History 9(2): 141-149] examined brooding postures and nest site fidelity in a nesting aggregation of western slimy salamanders (*Plethodon albagula*) from an abandoned mine shaft located in the Ouachita National Forest of southwestern Arkansas. From November 1999 through December 2001, the authors collected a photographic record of brooding and nesting behavior. Females oviposit a free-hanging, grape-like egg cluster within relatively dry nest perches along the walls of the mine shaft. Six female brooding postures were recorded from 101 observations involving 101 egg clutches. The most common brooding posture (34.6% of the time) was one in which the female positioned her shoulder region next to or in contact with her egg clutch. Body coiling around the egg clutch occurred 20.8% of the time and at about the same frequency as brooding postures involving eggs touching the head (17.8%) or trunk (22.8%). Six females (6.3%) exhibited nest site fidelity; one female returned to the same nesting site in each of three nesting seasons, but successfully brooded a clutch during the first season only. Egg predation by a ring-necked snake was observed during the 2001 nesting season. These results suggest that brooding postures may function as a predator defense mechanism and may also serve as an antimicrobial defense. The autumn/winter nesting season appears to serve as an antipredator strategy in this species.

AMPHIBIANS OF THE GAMBIA

C. Emms et al. [2005, The Herpetological Bulletin 94:6-16] present an up-to-date checklist of the amphibian fauna of The Gambia, the smallest country in continental Africa. The authors have collated data from the existing literature, including unpublished material, and from their own surveys. The resulting list comprises 35 frog species, six of which (*Bufo maculatus*, *B. pentoni*, *Phrynobatrachus* cf. *calcaratus*, *Pyxicephalus edulis*, *Arthroleptis* cf. *poecilonotus* and *Leptopelis bufonides*) are new to The Gambian checklist. The report includes color photographs of seven species.

EFFECTS OF TAIL LOSS

R. M. Goodman [2006, J. Herpetology 40(1):99-102] notes that tail autotomy serves as an aid to escape predators in many lizards, but potential costs include loss of fat stores, impaired locomotion, loss of social status, and reduced growth and reproductive output. Two potential costs of tail loss were examined in juvenile skinks, *Eumeces fasciatus*, through manipulation in a laboratory study. Changes in growth and sprint speed were compared among full autotomy, partial autotomy, and control groups of lizards after these treatments at three weeks of age and up to four weeks later. Full tail autotomy was associated with increased growth in mass during the two weeks posttreatment and increased growth of the tail between two and four weeks post-treatment. No other measures of growth were affected by partial or full tail loss. Immediately following treatments, fully autotomized lizards became significantly slower, with respect to maximum sprint speed, relative to both other groups. However, this effect was gone by four weeks after tail loss.

REPRODUCTIVE BEHAVIOR IN COMMON LIZARDS

S. Hofmann and K. Henle [2006, J. Herpetology 40(1):1-6] note that the common lizard (*Lacerta vivipara*) is a small, nonterritorial, live-bearing lacertid that is sexually dimorphic in several morphological traits (e.g., tail length, snout-vent length, head size). The authors used microsatellites to examine paternity in a wild population and investigated whether sexual dimorphism could be the result of intra- or intersexual selection. Multiple paternity was found in 65.4% of 26 clutches. There was no evidence of assortative mating. Successfully reproducing males were larger and heavier and had longer tail regenerates or intact tails compared to those that did not reproduce. Tail length and body condition of males were related to the number of offspring sired. However, no evidence was found that head width was related to male reproductive success. The authors conclude that (1) males with higher body condition index might be more successful in male-male interactions or might be able to search more effectively for females, (2) sex divergence in relative tail length in common lizards reflects the action of sexual selection for male reproductive success, and (3) intersexual dietary divergence could be an alternative hypothesis for head size difference between sexes rather than intrasexual selection.

POPULATION DENSITIES OF THE COQUÍ

L. L. Woolbright et al. [2006, J. Herpetology 40(1):122-126] note that *Eleutherodactylus coqui*, accidentally introduced to east Hawaii Island in the late 1980s, has since become established as scattered populations across the island. Mark-recapture study plots indicate that population size remains small for the first year after initial colonization. Plots in heavily forested areas where the coquí has become well-established yield population estimates of frog density three times the estimates reported from native populations in Puerto Rico. Surveys of the Hilo area using sound pressure level meters found many loud chorusing populations producing sound pressure levels up to 73 dB suggesting that this frog will achieve high densities through broad areas of Hawaiian forest and towns. The authors suggest that the apparent lack of native or exotic predators in Hawaii and abundance of suitable retreat sites contribute to achievement of unusually high population densities of *E. coqui* in Hawaii compared with Puerto Rico.

AMPHIBIANS OF MAURITANIA

J. M. Padial and I. De la Riva [2004, Revista Española de Herpetologí a 18:89-99] present the first distributional checklist with commentaries of amphibians of Mauritania. This country contains 11 anuran species belonging to three families: Bufonidae (three species), Hyperoliidae (one species), and Ranidae (seven species). New distribution information includes the first record of *Ptychadena* aff. *mascareniensis* and the second record of *Pyxicephalus edulis* in Mauritania. Two species have been removed from the list (*Bufo mauritanicus* and *Hildebrantia ornata*). Most species are Afrotropical and inhabit the Sahel savannas of the south, while some occur in wet areas of the Sahara. There are believed to be at least 19 other unreported species in the country.

Unofficial Minutes of the CHS Board Meeting, May 19, 2006

Linda Malawy called the meeting to order at 7:28 P.M. Board members Rich Crowley, Betsy Davis, Mike Dloogatch and Erik Williams were absent.

Officers' Reports

Recording Secretary: Zorina Banas read the minutes of the April 14 board meeting. Minor adjustments were made and the minutes were accepted.

Treasurer: Andy Malawy distributed the financial reports for April 2006, including a report on this year's ReptileFest.

Membership Secretary: Deb Krohn distributed the April 2006 membership report, showing 579 members. Deb reported that Big Sand Mound has extended an invitation to CHS members for its yearly field day, June 10.

Sergeant-at-arms: Mike Scott reported that there were 47 members at the April general meeting.

Committee Reports

Shows: Project Exploration Dino Dinner, June 1, River East. Peggy Notebaert Nature Museum, June 3-4. Museum of Science and Industry, June 10 (opening day "Frogs, a Chorus of Colors"). Museum of Science and Industry, July 19 (Members' Night), register with Jenny Vollman prior. Illinois State Fair-Springfield, August 11.

Raffle: Linda Malawy will bring the raffle items again this month. We are still in need of a raffle coordinator.

Old Business

Insurance: The liability insurance for CHS board members has been renewed.

Procedures and Responsibilities Binder: If anyone has anything of interest that they would like to add to the binder please see Rich Crowley.

List of Vets: Cindy Rampacek reported that three-quarters of the letters have been mailed.

Deb Krohn reported that the display board to aid in membership recruitment is coming along nicely.

New Business

Banners: Additional banners for CHS shows will be discussed at the next board meeting.

Roundtable

Jason Hood suggested sending out reminders before any CHS shows.

The Turtle Survival Alliance will be having their 4th annual conference August 10-13 in St. Louis.

The meeting was adjourned at 9:20 P.M.

Respectfully submitted by Zorina Banas, Recording Secretary

Next time you surf the WorldWide Web, crawl, run, slither, slide, jump, or hop over to the CHS web site!

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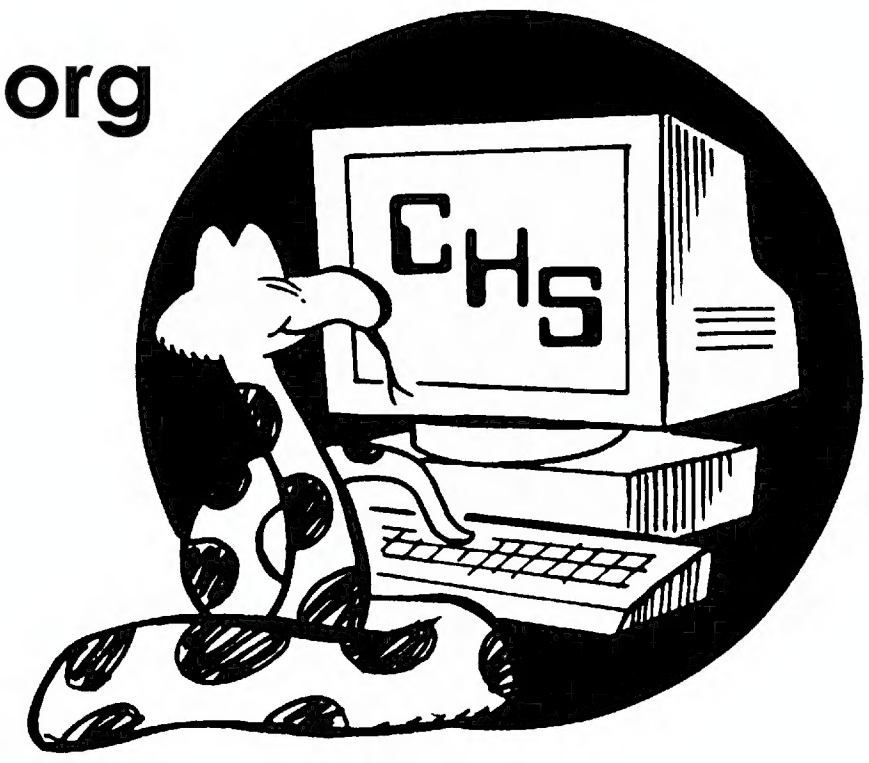

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Chicagoherp.org is accepting applications for banner advertisements or links from herpetoculturists and manufacturers of herp-related products. Visit the site and contact the webmaster for details on how you can sponsor CHS!

Advertisements

For sale: rats and mice—pinkies, fuzzies and adults. Quantity discounts. Please send a SASE for pricelist or call Bill Brant, *THE GOURMET RODENT*, 6115 SW 137th Avenue, Archer FL 32618, (352) 495-9024, E-mail: GrmtRodent@aol.com.

For sale: from **The Mouse Factory**, producing superior quality, frozen feeder mice and rats. We feed our colony a nutrtionally balanced diet of rodent chow, formulated especially for us, and four types of natural whole grains and seeds. Mice starting from: pinks, $.17 each; fuzzies, $.24 each; hoppers, $.30 each; weanling, $.42; adult, $.48. Rats: starting with pinks at $.45 each, to XL at $1.80 each. Discount prices available. We accept Visa, MC, Discover or money orders. PO Box 85, Alpine TX 79831. Call **toll-free** at (800) 720-0076 or visit our website: < http://www.themousefactory.com> .

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For sale: herp books. *The Snakes of Arizona* by Jack A. Fowlie, 1965, l64 pp., b&w photos, range maps, signed by author, hardbound, $55; *Australia's North* by Stanley and Kay Breeden, 1975, 208 pp., many excellent color and b&w photos (some full page), DJ, an outstanding account of the natural history of primarily the Top End (i.e., Kakadu), many photos of herps, hardbound, $35; *The British Amphibians and Reptiles* by Malcolm Smith, 1973 (5th ed.), 322 pp., 91 figs., l6 b&w plates, very complete detailed treatment, DJ, hardbound, $25; *Boy's Book of Snakes* by Percy Morris, l948 (first ed., first printing), l85 pp., many b&w photos, a few ink marks at bottom of introductory page, hardbound, $20; *Additions to the Herpetofauna of Nayarit, Mexico* by Richard Zweifel, 1959, 13 pp., softbound, $7. All publications in excellent condition except as noted. Postage and handling $2.50 for orders under $25, free for orders of $25 or more. William R. Turner, 7395 S Downing Circle W, Littleton, CO 80122, (303) 795-5128, e-mail: toursbyturner@aol.com.

For sale: Large vintage museum display case 1927, glass on three sides, oak skirt and frame, 6' × 6' × 2.5', built-in fluorescent fixture. Great for large snakes or lizards, $400. David McGowan, (773) 271-0793.

For sale: c.b. '06 rare and unusual garter snakes. **Eastern**—normals $25 each/2 for $40, albinos (various bloodlines) $250, granite $150, het granite $75, melanistic $40, Florida $25 each / 2 for $40, flames $100, flame × albino $150 each / $275 pair, erythristics $100 each, erythristic × albino $150 each / $275 pair, snow (limited numbers) $395, paradox leucistic $450, possible hets $250– 300 pair. **Plains**—normals $25 each / 2 for $40, anerythristic $40, axanthic $75, albinos—2 strains $75, quad hets $75, Christmas albino $125, super Christmas albino $175, hybinos $195, snow—2 strains $95. **California red side** $125. **Wandering**—normals $25 each / 2 for $40, melanistic $95, het melanistics $45, chocolate $95. **Santa Cruz** $60. **Red-sided**—normals $25 each / 2 for $40, albinos $375, anerythristic $75, double het snow $225 pair. **Eastern black-necked** $95. **Blue-striped (*similis*)** $40. **Mesoamerican highlands**, $40. Scott, (919) 365-6120 EST, email sfelzersgarters@bellsouth.net, web address: www.gartersnakemorphs.com.

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Internship: The Kentucky Reptile Zoo, a nonprofit organization, seeks student interns for the 2006 season. The zoo is an educational exhibit, reptile breeding and venom research facility located near Kentucky's Red River Gorge and Natural Bridge State Park. The intern will assist in the captive maintenance of the zoo's reptile collection, collect admissions to the exhibit, give interpretive talks and interact with the public, assist with educational outreach programs, and perform other duties as assigned. In addition, the intern will be responsible for the completion of at least one research project related to the field of herpetology. The intern will *not* be involved in the handling of any venomous species. Desirable qualifications include a willingness to handle snakes and other reptiles on a daily basis, ability to communicate effectively with people, writing skills, orientation to details, and self-motivation. The intern will be required to work both Saturday and Sunday, with days off during the week. Students majoring in the biological or natural sciences are preferred. Interns are required to be either college students or recent graduates. Former interns have arranged for academic credit with their institutions. Benefits include experience with one of the most extensive and diverse collection of snakes in the U.S., housing and $55/week to cover expenses. Interns have been successful in finding zookeeper positions: over 95% hire rate! Personal transportation is recommended. A valid driver's license is required. Starting dates are flexible, but a minimum of 3 months covering fall (September– November) is required. Deadlines is July 1 for fall. To apply send a cover letter, resume, transcript, and at least 2 (preferably 3) references to: Kristen Wiley, Internship Coordinator, Kentucky Reptile Zoo, 200 L&E Railroad, Slade KY 40376. Or E-mail: kyreptil@pop.mis.net.

Virtual Museum of Natural History at www.curator.org: Free quality information on animals—emphasis on herps—plus expedition reports, book reviews and links to solid information. Always open, always free.

Wanted: I'm looking for my soulmate. I want to settle down to a family before it is too late. But I have this problem. . . . When we get into hobbies and interests: old popular records, jazz and show tunes, and antique electronics are fine, but when I mention turtles, "What, are you crazy?" So maybe this is a better place to look. Please don't try to separate me from my turtles—at least not most of them. If interested, please drop a line to Ellis Jones, 1000 Dell, Northbrook IL 60062, telling a bit about yourself and giving a phone number.

Line ads in this publication are run free for CHS members—$2 per line for nonmembers. Any ad may be refused at the discretion of the Editor. Submit ads to: Michael Dloogatch, 6048 N. Lawndale Avenue, Chicago IL 60659, (773) 588-0728 evening telephone, (312) 782-2868 fax, E-mail: MADadder0@aol.com.

UPCOMING MEETINGS

The next meeting of the Chicago Herpetological Society will be held at 7:30 P.M., Wednesday, June 28, at the Peggy Notebaert Nature Museum, Cannon Drive and Fullerton Parkway, in Chicago. This will be our popular and always well-attended annual **Show & Tell** meeting. Bring an animal that you find interesting for one reason or another and be prepared to give a short (under five minutes) presentation to the group. Don't be shy. Age (yours) or commonness (the animal's) should not be a limitation. Guidelines for the occasion: don't bring venomous reptiles or endangered species, and please bring only amphibians or reptiles (this means no worms, tarantulas or other invertebrates).

At the July 26 meeting **Robert Henderson** of the Milwaukee Public Museum will speak about his latest research on the "Tree Boas of Granada."

The regular monthly meetings of the Chicago Herpetological Society take place at Chicago's newest museum — the **Peggy Notebaert Nature Museum**. This beautiful new building is at Fullerton Parkway and Cannon Drive, directly across Fullerton from the Lincoln Park Zoo. Meetings are held the last Wednesday of each month, from 7:30 P.M. through 9:30 P.M. Parking is free on Cannon Drive. A plethora of CTA buses stop nearby.

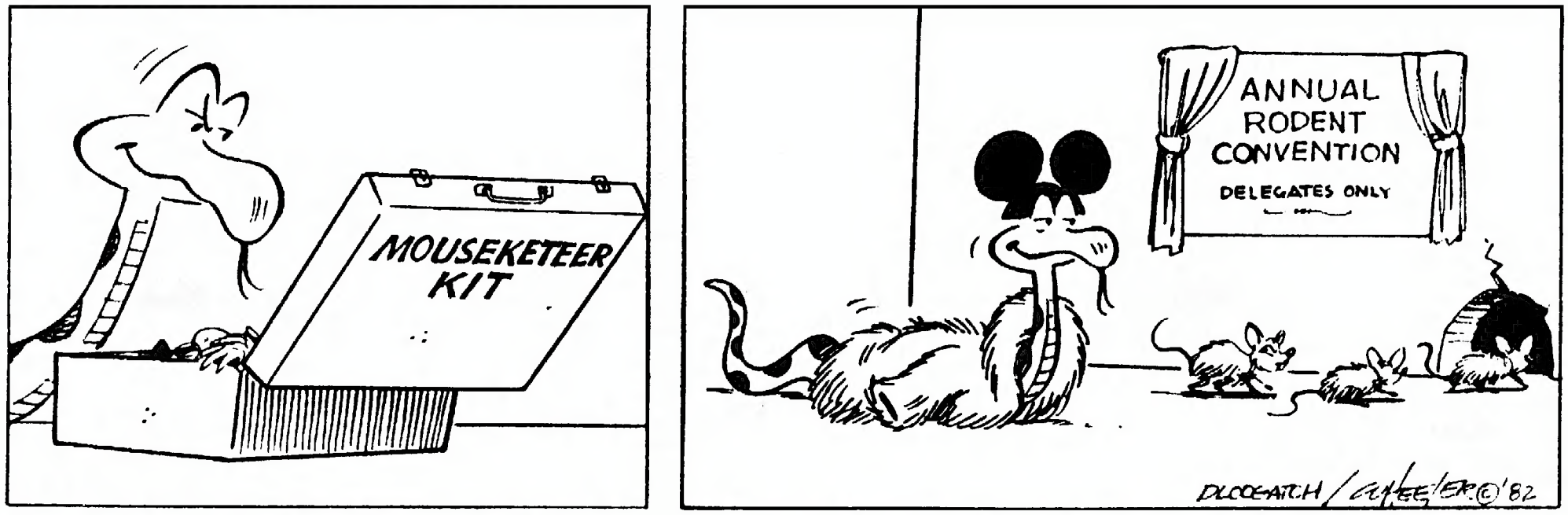
Board of Directors Meeting

Are you interested in how the decisions are made that determine how the Chicago Herpetological Society runs? And would you like to have input into those decisions? If so, mark your calendar for the July 14 board meeting, to be held at the North Park Village Administration Building, 5801 North Pulaski Road, Chicago. To get there take the Edens Expressway, I-94, and exit at Peterson eastbound. Go a mile east to Pulaski, turn right and go south to the first traffic light. Turn left at the light into the North Park Village complex. At the entrance is a stop sign and a guardhouse. When you come to a second stop sign, the administration building is the large building ahead and to your left. There is a free parking lot to the left and behind the building.

The Chicago Turtle Club

The monthly meetings of the Chicago Turtle Club are informal; questions, children and animals are welcome. Meetings normally take place at the North Park Village Nature Center, 5801 N. Pulaski, in Chicago. Parking is free. For more info call Lisa Koester, (773) 508-0034, or visit the CTC website: http://www.geocities.com/~chicagoturtle.

THE ADVENTURES OF SPOT



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